Assignment 1 | FPGA Lab

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January 2022

1 Question

A training institute intends to give scholarships to its students as per the criteria given below :

• The student has excellent academic record but is financially weak.

OR

• The student does not have an excellent academic record and belongs to a backward class.

OR

• The student does not have an excellent academic record and is physically impaired.

The inputs are:

INPUTS

A: Has excellent academic record

F: Financially sound

C: Belongs to a backward class

I: Is physically impaired (In all the above cases 1 indicates yes and 0 indicates no).

Output : X [1 indicates yes, 0 indicates no for all cases]

Draw the truth table for the inputs and outputs given above and write the SOP expression for X(A,F,C,I).

2 Solution

2.1 Truth Table

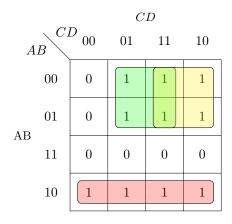| A	F	C	I	$\mathbf{X}$
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

2.2 Karnaugh Map for given truth table

Figure 2.1: Karnaugh-Map

2.3   SOP EXPRESSION

$$X = A.F' + A'.C + A'.I \tag{1}$$